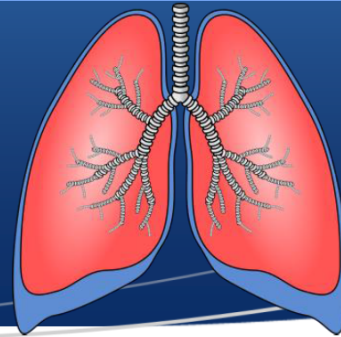


The Gas Exchange

Official News Magazine of the Cardiorespiratory Division

What do you think the CRD should include in our upcoming newsletter? Do you have a story you would like to share? Please drop us a line at cardioresp@physiotherapy.ca



Resistance Exercise with Compression for women with Lymphedema: Systematic Review

Mona M. AlOnazi, BScPT, Margaret L. McNeely, PhD
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Introduction

Lymphedema is one of the most distressing and dreaded side effects of breast cancer treatment occurring in approximately 21% of survivors¹. Breast cancer-related lymphedema (BCRL) is a chronic, progressive and debilitating swelling that presents in the breast, chest wall and arm on the side of the breast surgery. BCRL is associated with numerous upper extremity effects including symptoms of pain, tension and heaviness in the arm; decreased shoulder range of motion and strength; and may negatively affect upper extremity function^{2,3}. As a result, survivors with lymphedema often have poorer quality of life (QOL) compared with those without it^{2,3}. Both range of motion and light resistive exercise (to enhance muscle pump effect on lymphatics) have traditionally been prescribed in the conservative management of lymphedema. Current evidence also supports the safety of progressive resistance exercise (RE), with no adverse effects on symptoms or swelling⁴⁻¹¹. However, little is known about the benefit of combining compression therapy with RE in reducing swelling associated with BCRL.

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Mona AlOnazi, Margaret McNeely, Laurie McLaughlin, Tania Larsen, Mary Jane O'Donovan, Mary Massery, Angela Dery

Editors

Christopher Farley, Tyler Milton,
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Message from the Chair

Hello Fellow Cardiorespiratory Division Members,

It is my sincerest pleasure to be given the opportunity to serve as of Chair of the Cardiorespiratory Division (CRD)! I have served as Co-Coordinator of Education for the past 6 years and I am very excited about assuming this new role within the Division. We have a wonderful group of executive committee members and I sincerely look forward to the next couple years serving as Chair.

I want to extend a heart-felt thank-you to **Trish Parsons** for all of her hard work over the past 2 years as Chair and I am happy to report that Trish will remain on the executive as Past Chair for 2016-2017! Trish's experience, knowledge and enthusiasm will be a great asset to the Division as we continue to move forward with some exciting CRD initiatives.

There have also been a few other changes in our executive committee this year—**Cathy Anderson** completed her term as Past Chair and **Cynthia Otfinowski** completed her term as Treasurer; a sincere thank-you to Cathy and Cyndi for all of their hard work

over the past several years. I am also pleased to announce that **Monique Prendergast** will be rejoining the CRD Executive as Treasurer. Welcome back Monique!

I'd like to take this opportunity to congratulate the CRD award winners from this past Spring. Congratulations to **Kenneth Wu**, winner of the CRD Division Scholarship and to **Mona Al Onazi**, winner of the CRD Student Research Award; best of luck to you both with your future work.

Our Education Coordinator has been hard at work organizing the Fall CRD courses—including courses offered in British Columbia and Thunder Bay, ON. For the up-to-date list of CRD course offerings, please check our website. If you are interested in hosting a CRD course in your area, please contact the Division.

Have a great Summer Everyone.

Warmest Regards,

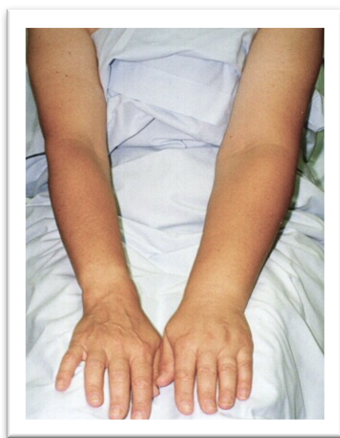
Tania Larsen



In this Edition of the Gas Exchange

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Objectives

This systematic review aimed to examine the benefit of combined compression therapy and RE on BCRL.

Methods

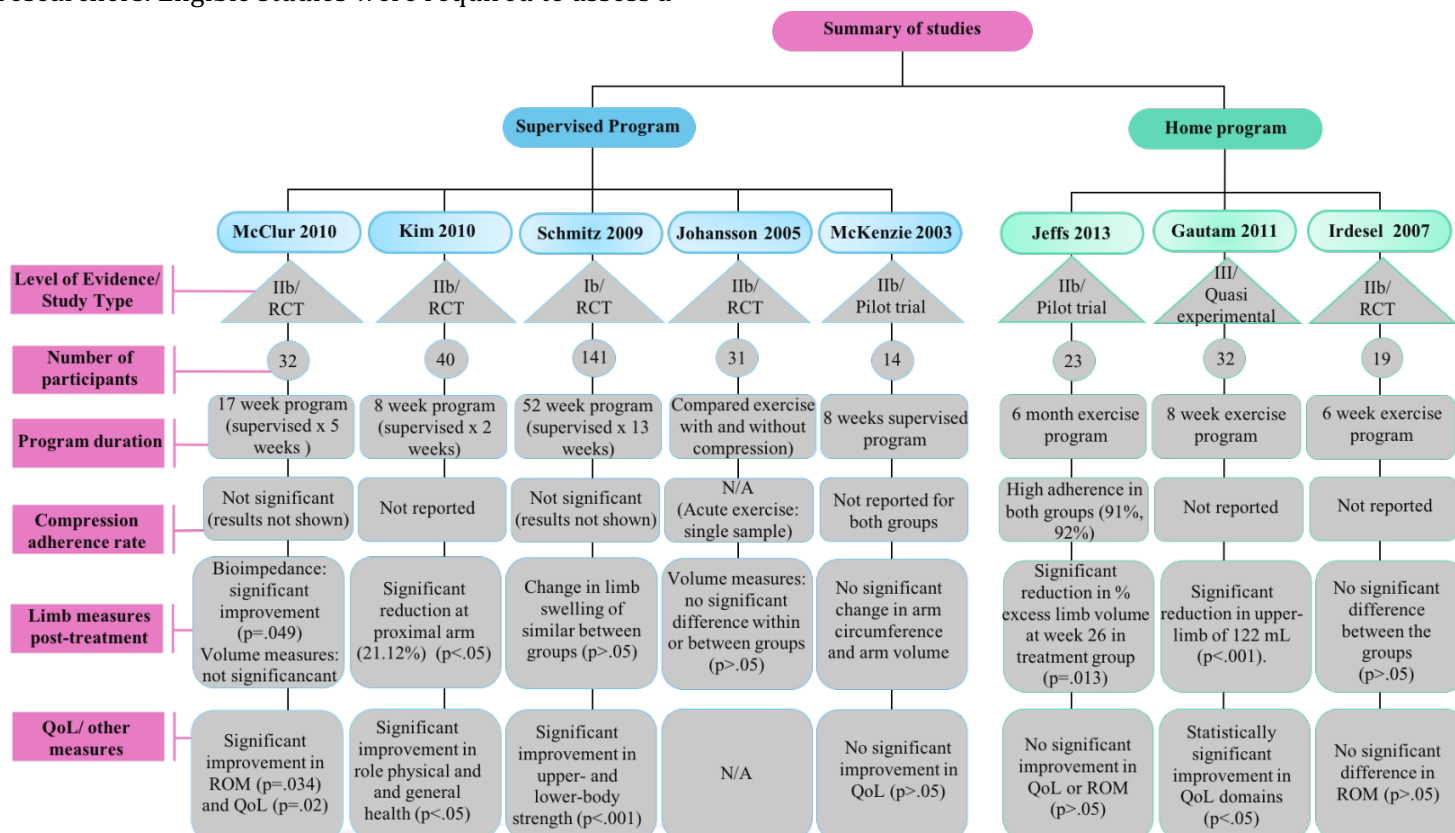
The electronic database searches were conducted in Medline, EMBASE, CINAHL and PEDRO by two researchers. Eligible studies were required to assess a

combined therapy using compression and RE as an intervention for BCRL. The primary outcome was limb volume measurement and secondary outcomes included ROM, muscle strength and quality of life. A qualitative analysis was conducted based on Sackett's levels of evidence.

Results

Forty-eight studies were found and eight met the eligibility criteria⁴⁻¹¹. No large randomized controlled studies were found that specifically examined combined compression and RE. Included studies generally prescribed mild to moderate intensity RE in conjunction with use of a compression garment. Based primarily on Level II and III evidence, findings suggest that RE was not associated with an increase in arm volume and may prove beneficial in reducing proximal arm volume.

In general, details were lacking on compression method including garment type and features. Adherence to compression was provided in only three studies^{4,6,9} and only one study reported actual adherence rates⁹. Results of the included studies supported improvement in self-reported severity of lymphedema symptoms; shoulder



ROM, upper body strength, QOL and a lower incidence of lymphedema exacerbations.

Conclusions

Findings from this review suggest potential benefits from combined compression therapy and RE in reducing proximal arm volume. Further research is needed examining compression therapy mode and features (e.g., bandaging vs compression garment, compression level) as well as paying closer attention to adherence to compression therapy both during and after RE sessions.

Clinical Implications

The use of combined compression and RE for BCRL may help to reduce lymphedema exacerbations, and improve lymphedema symptoms, shoulder ROM and strength, and quality of life, but has not conclusively been shown to reduce arm lymphedema volume.

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Walking with sticks

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Why would I want to use sticks to walk? I don't need any support. It looks geeky! These are often the initial responses from folks when pole walking is brought up.

For many reasons though, Nordic Pole Walking IS the smarter way to walk for exercise¹. This walking technique began in the Scandinavian countries more than two decades ago as a way for cross-country skiers to train during the summer months. It quickly became adopted as a low-impact form of exercise among the general population and spread across Europe. Participation in Nordic Pole Walking (NPW) has grown to the point where today more than 10 million Europeans regularly pole walk. It is done amongst all age groups as a safe and effective form of low impact exercise and is one of the fastest growing fitness activities. In 2000, the International Nordic Walking Federation was founded with the goal of promoting and developing NPW globally (www.inwa-nordicwalking.com). In North America we have been later to adopt NPW, but awareness and participation are steadily rising.

Nordic pole walking has two major benefits over regular walking. Because the arms and the trunk are working in addition to the legs, more than 90% of the body's muscles are activated, versus only ~50% used with regular walking^{1,2}. The poles, used properly, help to propel the walker along faster. Walking speed in trained NPW participants is substantially increased over regular walking^{1,3}. Because of the increased walking speed and muscle activation, NP walkers get more "bang" for their walking "buck". NPW can burn up to 67% more calories than regular walking in experienced NP walkers³, though most studies report increased energy expenditure in the range of 20-25% more than regular walking^{1,2,4}. Though NP walkers are working harder than regular walkers, their ratings of perceived exertion are actually lower^{4,5} allowing folks to achieve more without feeling that they are working too hard

Particularly for individuals with chronic health conditions such as diabetes, cardiovascular or peripheral vascular disease, who have been told to walk regularly for their health, NPW augments the beneficial effects of walking for exercise. Additionally, for those who need it, the poles can increase balance



and stability while walking, allowing those individuals to participate more safely and more effectively in their walking program.

However, you can't just pick up some poles, start walking with them and expect the benefits. NPW is not just trekking or hiking with poles. Proper technique is important to obtain the beneficial effects. The use of the poles in NPW is similar to the use of the cross-

country ski poles. The poles are never planted in front of the body, but always held at an angle (see photo). Used in this way, the poles allow normal arm swing while using the strength of the arm and the trunk musculature to propel the walker forward. The Nordixx website (www.nordixx.com/pages/teaching-the-technique/) describes the technique, but it is best learned with feedback from an instructor. Many community groups and some Physiotherapy clinics offer free or low cost introductory classes.

Across Canada, many PTs are seeing the value in NPW and incorporating it into their practice model as a fun and easy way to help patients and community members achieve improved fitness, mobility and wellbeing. For good examples of this, check out the websites of Best Health Physiotherapy (Kingston, ON), Inside Out Physiotherapy (Toronto, ON), and Golden Ears Physiotherapy (Maple Ridge, BC). Additionally, there is ongoing research at several sites in Canada specifically looking at the benefits of NPW in different patient populations.

As a practicing PT and certified NPW Instructor, I have become very excited about the benefits of NPW for my patients – AND I love NPW myself! Patients and participants in our NPW introductory clinics and classes report many positive, sometimes unexpected effects from adding Nordic Poles to their walking. Most note that they can do their usual walking route in a shorter time, thus obviously they are walking faster and working harder. Many really appreciate the overall muscle activation and feel of their trunk musculature working as they walk, finding that they feel more fit overall. Others have noted improved posture and increased endurance of their upper body postural musculature.

NPW is an easy fitness activity to fit into most people's lifestyle. It can be done virtually anywhere and year round; no special equipment is needed beyond the poles. NPW groups are developing around the country. Nordic Pole Walking NS (nordicwalkingnovascotia.ca) is a great example of a larger scale group with an informative website, organized groups and events. NPW is fast becoming a fun, sociable, accessible way to be active.

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Breathing and Postural Control: It's all about Pressure!

Mary Massery PT, DPT, DSc
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Introduction

Control of posture and breathing is all about controlling pressure. Instead of controlling the lungs, postural control necessitates controlling pressure throughout the trunk; from the glottis on top, to the pelvic floor on the bottom. Postural control describes dynamic stabilization of the spine, pelvis and rib cage in order to modulate small graded movements of the trunk to maintain an upright position (balance).

Soda-pop can model of postural control

A soda-pop can can be used as an analogy to describe pressure management of the trunk (Figure 1).¹ The aluminum shell of a soda-pop can is flimsy and easily crushed if the pop-top is opened. However, when the pop-top is closed, the carbonation from within the can exerts greater outward pressure than atmospheric pressure exerts inward, providing functional stability to the thin aluminum shell. Our skeletal frame operates similarly. Positive pressures from within our trunk provides stability to the spine and the entire trunk,

preventing atmospheric forces from crushing our musculoskeletal frame.

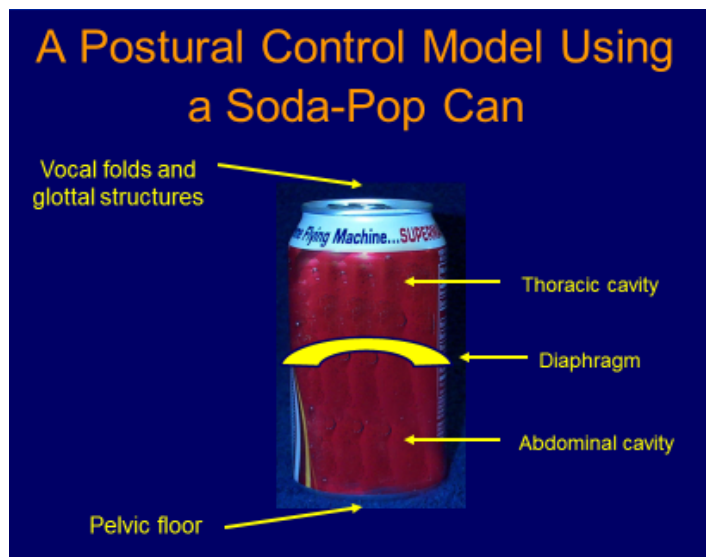


Figure 1: Soda Pop can model of postural control.

The diaphragm is the body's major pressure regulator, completely separating the thoracic and abdominal chambers. Together with the superior valve (vocal folds) and inferior valve (pelvic floor), the diaphragm simultaneously controls trunk pressure for breathing and postural stability, which functionally links the top and the bottom of the can.

Postural control's relationship to breathing control

The muscles that control breathing mechanics are the same muscles that control posture and has been well documented in the literature for over a decade.²⁻⁶ Hence, successful simultaneous coordination of postural stability and respiratory mechanics depends on how well the patient with motor impairments can generate, regulate and maintain trunk pressures in both the thoracic and abdominal cavities. In addition to the muscles that surround these cavities, three valves aid in the modulation of trunk pressures: 1) the glottis, 2) the diaphragm, and 3) the pelvic floor. Failure to simultaneously modulate intra-thoracic pressure (ITP) and intra-abdominal pressure (IAP), can result in inadequate pressure for postural control and breathing.



Figure 2: "Crushed" soda-pop can. M.F.

3-1/2 y/o girl with C5 complete spinal cord injury secondary to traumatic vaginal delivery. Her trunk was "crushed" by gravity as she was unable to generate opposing forces on her developing musculoskeletal structure. The harder she worked to breathe, the greater a pectus force was generated on her developing anterior rib cage, creating a vicious circle: an increased pectus excavatum and spinal deformity leading to increased respiratory restrictions and repeated pneumonias.

Control of trunk pressure is even more important in pediatrics because the musculoskeletal system is immature and easily influenced by adverse forces (Figure 2). Without support, the spine will collapse anteriorly, further compromising breathing. Over the long term, the spine and rib cage will likely develop severe deformities that further limit respiration.⁷ In this clinician's nearly 40 years of experience, many consequential musculoskeletal deformities can be prevented or minimized with long-term PT interventions geared toward counteracting deforming forces. A single case illustrating a child's development from age 3-12 y/o with a traumatic spinal cord injury at birth, represents a successful reversal of severe musculoskeletal deformities through a comprehensive rehabilitation program.⁸ She did not have rehabilitation prior to age 3 y/o (Figures 2-4).



Figure 3: Thoracolumbosacral orthosis (TLSO) with abdominal cutout.

M.F. Now 6 y/o. Her spine was aggressively managed up to puberty with a TLSO with an abdominal cut-out and abdominal binder which optimized spinal alignment and diaphragmatic pressure support. Per her orthopedic surgeon, the surgical correction was more successful due to the team's careful attention to her spine up to that point. Patient will continue to need an abdominal binder to support IAP, but will no longer need a TLSO after spinal fusion.



Figure 4: The success of a long-term multi-disciplined team management to reverse deforming musculoskeletal forces and to optimize breathing mechanics

M.F. Now 12-½ y/o. Note the complete reversal of her pectus deformity and other rib cage mal-alignments due to comprehensive PT and medical management programs.

Glottis as a postural stabilizer

My doctoral research explored the relationship of the glottis to postural stability.⁹ Seven different glottal conditions (Table 1) were tested during minimal postural perturbations in stance (sagittal plane) to determine which, if any, glottal condition caused a greater postural disturbance. The perturbation was intended to duplicate minor everyday balance disturbances like being bumped in a crowd. Our significant findings were:

1. *Thoracic cage/spine stability:* If the glottis was not allowed to engage in the balance response (open-glottis conditions), balance was significantly more impaired than any other glottal condition ($p < 0.002$). The large-volume open-glottal condition caused a greater balance disturbance than the small-volume condition (FRC – functional residual capacity).
2. *Stance center of pressure stability:* Backward balance challenges caused greater balance disturbances than forward challenges. In backward balance conditions, both extremes of glottal conditions, “maximal inhalation breath-hold” and “sigh” conditions, were less stable than the mid-range condition of counting ($p < 0.04$).

Table 1: Massery dissertation research: Seven glottal conditions used during gentle perturbation challenges.

Glottal Conditions	Variables
<i>Glottis closed:</i> Breath-hold conditions	1. Maximal inhalation, then breath-hold
	2. Normal exhalation (functional residual capacity), then breath-hold
<i>Glottis partially open:</i> Mid-range conditions	3. “Ah” voicing
	4. Counting out loud (1 – 10)
	5. Natural Breathing
<i>Glottis open:</i> Airway voluntarily kept open	6. Maximal inhalation, then sigh (“Ha”) maintaining open glottis
	7. Normal exhalation (functional residual capacity), then airway kept open (no breath-hold)

“These results show that airway modulation affects postural control during upright perturbations. The thorax was more stable when the glottis was engaged than when it was required to remain open, whereas control of center of pressure displacement appeared more optimal during the natural dynamic mid-range airway modulation of voicing. These data suggest that glottal control influences balance, and that glottal control strategies may be an important consideration for patients with breathing and/or balance disorders.” (abstract, p.483)⁹

Take away points for physical therapists:

1. Management of IAP and ITP is critical for balance, postural alignment, and long-term postural development as well as respiration.
2. The glottis plays an active and significant role in normal balance reactions, thus decisions about tracheostomies such as decannulation, initiation of Passy-Muir valves, etc., should include consideration of the impact of an artificial open airway on the patient's balance and for children, on their postural development as well.
3. Use of a Passy-Muir Valve, or other speaking valve, for increased balance, limb-force production, and postural alignment, should be considered a primary reason for initiating a speaking valve trial.
4. Pushing activities demand engagement of the vocal folds, causing an increase in ITP that can be used to improve the patient's ability to meet increased postural demands (balance challenges) and simultaneously strengthen the vocal folds.
5. Voicing can be used to primary PT tool to develop mid-range postural control.
6. Children who cannot be decannulated, nor tolerate a PMV, and are low tone, may need more spinal support than their adult peers to minimize or prevent the development of spinal deformities, most notably scoliosis and kyphosis. In these cases, use of a TLSO (thoracolumbosacral orthosis) may be necessary. If so, an abdominal cutout should be used to optimize breathing mechanics.¹⁰

Summary

The diaphragm is the body's primary pressure regulator controlling pressures necessary to simultaneously support ventilation and postural control, to decrease reflux forces, to increase gastro-intestinal motility, and to increase venous return. Two external valves: the glottis and pelvic floor, work in concert with the diaphragm to aid in these functions. The glottis is an essential component of balance strategies. PTs should consider the implication of a tracheostomy on balance. Passy Muir Valves should be considered for trunk pressure management rather than just voicing.

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Cardiorespiratory Placement at Royal University Hospital

**Angela Dery, CSEP-CPT BHK,
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Class of 2016**

In March 2016 I had a cardiorespiratory placement at the Royal University Hospital (RUH) in Saskatoon, Saskatchewan. The placement was five weeks in duration and I spent time in two separate areas of the hospital. For the first part of the placement I worked in the medical-surgical department of RUH and for the second half of the placement I worked in the intensive care unit (ICU) and coronary care unit (CCU). It was advantageous to start working in the medical-surgical unit as it gave me basic cardiorespiratory experience prior to working in the ICU. The primary duties I had while working in the medical-surgical department were to conduct mobility assessments and follow up treatments for a variety of different patients. Regular components of the assessment included a subjective exam, observation, auscultation, and interpreting vital signs (i.e. respiratory rate, heart rate and oxygen saturation). I also saw a few patients for follow up chest physical therapy treatments on a daily basis. These treatments included mobilizing patients, performing percussion over affected lung segments in postural drainage positions and suctioning when required. A few patients also had inline suction devices, which made the suctioning procedure easier to complete.

For the second half of the placement I worked in the ICU and the CCU. The first few days working in this area of the hospital were intimidating. This was mostly due to the intensity of the environment in the ICU and CCU and the severity of patient cases. Most patients were on ventilators and had multiple tubes or lines going to different machines, so mobilizing was more difficult. Another difference in the ICU in comparison to the medical-surgical department was the one-to-one nursing ratio. Each nurse was responsible for one patient their entire shift so they were available to offer help if needed. As a physical therapy student working

in the ICU and CCU I had to effectively communicate with the nursing staff on a daily basis to provide appropriate care. I found this to be a difficult transition, because I would not communicate with nursing staff on the medical-surgical department as frequently, as they were busy with multiple patients. In the ICU it was essential to time treatments around the patient's schedule for the day. Most of the patients in the ICU and CCU had multiple healthcare professionals treating them throughout the day, so there were occasions where you had to come back at a later time to complete the assessment and treatment. I found the most efficient way to organize the scheduling was to go to the ICU first thing in the morning and have a conversation with each nurse regarding patients I needed to see that day so I could plan accordingly. This way, the nurses knew when I would be treating the patient and they would communicate this information to the healthcare team.

Overall, I had a really good experience at RUH with supportive clinical instructors. My mentors were confident in their role as physical therapists and were able to teach me the most efficient way to manage a caseload in the medical-surgical unit and in the ICU and CCU.

Canadian Physiotherapists Recognized on the World Stage

It's not like we didn't already know it ourselves, but clearly now the world is noticing, too! It was a banner December for Canadian physiotherapists.

Two of our own were recently honoured with prestigious World Confederation for Physical Therapy (WCPT) awards, and CPA also received notice that the visionary responsible for the foundation of the profession in Canada, Enid Graham, has been designated a National Historic Person by the Honourable Leona Aglukkaq, federal Minister of the Environment.

Dr. Dina Brooks and Dr. Michel Landry – WCPT International Service Awards

WCPT awards for International Service honour individuals who have made a significant contribution to physical therapy internationally or within their region. Winners have demonstrated leadership, made distinguished contributions, or had a high impact on the profession at an international or regional level through service in one or more of the following areas: practice; education; research; management and administration; and advocacy.

Dr. Dina Brooks has been awarded the 2015 International Service Award for Research and Dr. Michel Landry has won the 2015 International Service Award for Practice. Both awards will be presented at the WCPT AGM in Singapore in May, 2015.

Dr. Dina Brooks' research work is unparalleled in the world. She has published more than 200 peer-reviewed publications and, along with her co-investigators, has been awarded more than 100 research grants. The direct impact of her research has been in the advancement of the field of pulmonary rehabilitation. Her research has contributed to pulmonary rehabilitation being a standard of care for people living with COPD. Dr. Brooks' research program includes: investigating how to better measure the physical activity of people living with COPD, evaluating current rehabilitation strategies and establishing better long-term approaches to ensure the pulmonary rehabilitation benefits are maintained.

Dr. Brooks' ability to translate and transfer knowledge from the research realm to practice is exceptional. She has led the field in evidence-based practice especially in conducting systematic reviews and developing clinical practice guidelines in the area of pulmonary rehabilitation. These knowledge translation interventions of her research findings can be easily applied by physiotherapists to help with assessment and treatment of patients which leads to improved quality of care and optimized quality of life for individual patients.

Dr. Landry's experience as a physical therapist spans 20 years, and covers a diverse range of expertise: humanitarian aid in disaster and post-conflict zones, global health and rehabilitation, and health services

research. Dr. Landry's leadership extends to developing a generation of physiotherapy practitioners who possess both the passion and the competence to serve the world's populations. An adjunct professor at the University of Toronto, and working on both sides of the boarder, he is a much sought-after consultant for physiotherapists and physical therapy educators in low and middle-income countries. These collaborations are now developing into educational opportunities in Global Health and Rehabilitation for students around the world.

CPA is thrilled to see both Dina's and Michel's contributions recognized at a global level!

Enid Graham – National Historic Person

Enid Graham is widely recognized as the founder of physiotherapy in Canada. She united the fields of massage and remedial gymnastics in 1920, helping to create the Canadian Association of Massage and Remedial Gymnastics (the association you know and love today as CPA!) to establish high national standards for physiotherapy education and practice.

She taught at several schools, including the Military School of Orthopaedic Surgery and Physiotherapy at the University of Toronto (Hart House) during WWI. In 1929, she promoted the establishment of the first university-based school of physiotherapy at U of T. She went on to chair CPA's Military Affairs Committee during WWII, ensuring expert overseas rehabilitation support for our military by accredited physiotherapists and developing a long-standing bond between the military and CPA that remains today.

Enid Graham is to the profession of physiotherapy in Canada what Florence Nightingale was to the profession of nursing worldwide. She was a visionary, a true leader and the ultimate champion for the profession as it has evolved.

The Historic Sites and Monuments Board of Canada will honour Enid Graham with an engraved plaque, to be installed at Hart House on the U of T campus in Toronto.

Upcoming CRD Courses

For details, see:

<http://www.physiotherapy.ca/Divisions/Cardiorespiratory/Courses>

Physiotherapy Management Principles for Patients with Acute Medical/Surgical Conditions

Date: Saturday Oct 22nd, 2016
8:30 am – 4:30 pm

Location: Surrey Memorial Hospital
Surrey, British Columbia

Physiotherapy Management Principles for Patients Who Are Critically Ill

Date: Sunday Oct 23rd, 2016
8:30 am – 4:30 pm

Location: Surrey Memorial Hospital
Surrey, British Columbia

Other Courses



Physical Therapy
UNIVERSITY OF TORONTO

Inaugural University of Toronto, Department of Physical Therapy Workshop: Exercise Training in Pulmonary Rehabilitation: A Practical Approach

This hands-on course is offered on November 12th-13th, 2016 by the Department of Physical Therapy at the University of Toronto. The course also includes an interactive online component prior to the hands-on weekend workshop.

This course will provide an evidence-based overview of pulmonary rehabilitation with a special focus on exercise that will be relevant for rehabilitation and exercise professionals. Participants will have the opportunity to learn about exercise limitation and general training principles. They will administer and interpret the results of various exercise and functional tests commonly used in pulmonary rehabilitation programs such as field tests (6 Minute Walk,

Incremental Shuttle Walk and Endurance Walk Test), strength, balance and inspiratory muscle testing and training. Oxygen therapy in the pulmonary rehabilitation setting will also be presented. A case study approach to exercise prescription will accompany the hands-on components.

Instructors

The course will be taught by internationally-recognized experts in pulmonary rehabilitation.

Dr. Darlene Reid is a Professor and Chair of the Department of Physical Therapy at the University of Toronto. Dr Reid's research themes have focused on dysfunction of the inspiratory and limb muscles in chronic lung disease that involves quantification of muscle structure and function at the cellular and macroscopic level. Recently, she has examined muscle oxygenation and the experience of pain in people living with COPD. Dr. Reid's was the senior editor of the recently released second edition of the textbook *Cardiopulmonary Physical Therapy: Management and Case Studies*.

Dr. Dina Brooks is a Professor in the Department of Physical Therapy at the University of Toronto. She holds a Canada Research Chair (Tier 2) in Rehabilitation in Chronic Obstructive Pulmonary Disease. Dr Brooks' research in the area of chronic lung disease includes several clinical trials on the effectiveness of different components and modes of delivery of pulmonary rehabilitation. Dr. Brooks teaches Cardiorespiratory and Exercise Physical Therapy in the MScPT program.

Dr. Sunita Mathur is an Assistant Professor in the Department of Physical Therapy at the University of Toronto. Her research examines skeletal muscle



dysfunction in people with COPD and she has published extensively on this topic. She has also presented her research on COPD at national and international conferences. Sunita teaches exercise physiology and prescription in the MScPT program.

Dr. Mika Nonoyama is one of the few respiratory therapists in Canada to have completed her PhD in clinical-based research (oxygen therapy for COPD), through the Rehabilitation Science Institute at the University of Toronto. She completed post-doctoral fellowships at Toronto Rehabilitation Institute and the University of Toronto Lawrence S. Bloomberg Faculty of Nursing. She currently is an assistant professor in the Faculty of Health Sciences at the University of Ontario Institute of Technology. She also holds a status-only assistant professor position in the Department of Physical Therapy at the University of Toronto, and a project investigator position in respiratory therapy and Child Health Evaluative Sciences at SickKids.

Lisa Wickerson has a BScPT and MSc from the University of Toronto, and is currently pursuing a PhD in the Rehabilitation Sciences Institute with a research focus on oxygenation in individuals with interstitial lung disease during exercise. Lisa has over 15 years of clinical experience in functional assessment and exercise prescription in the Lung Transplant Program at the University Health Network. Lisa is a lecturer in the cardiorespiratory unit of the MScPT program, and an instructor for the Oxygen Titration continuing education course at the University of Toronto.

For more information, please go to <http://www.physicaltherapy.utoronto.ca/news-events/events/inaugural-university-toronto-dept-physical-therapy-workshop-exercise-training-pulmonary-rehabilitation-practical-approach/>

Course Dates and Times

Sat Nov 12th, 2016, 9am to 5pm (registration at 8:30am)

Sun Nov 13th, 2016, 9am to 12pm

Online component begins Oct 11th, 2016 with weekly lecture recordings, which can be viewed on your own time and at your own pace.

Registration

Complete our [online registration form] and submit the required payment. Registration includes light refreshments (for mornings and breaks), lunch, access to online resources and a course manual.

Early Bird Registration (before September 15th 2016): \$405.00

Regular Registration (after September 15th 2016): \$450.00

Special Rate for U of T PT faculty with **current** Status-only appointment

Early Bird (before September 15, 2016): \$375.00

Regular (after September 15, 2016): \$420.00

Location

Rehabilitation Sciences Building, 500 University Avenue, Toronto

Questions

For further information, please contact pt.reception@utoronto.ca



Cardiorespiratory Division Executive—2016-2017

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Currently vacant – if you are interested in this role, please contact our chair, Tania Larsen.

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